

# RENEWABLE ENERGY DEVELOPMENTS

## IMPLICATIONS OF PROLONGED LOW ENERGY PRICES ON THE ENERGY MIX



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APERC Annual Conference  
25 May 2016

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# REN21 Renewables 2016 Global Status Report



[www.ren21.net/gsr](http://www.ren21.net/gsr)

**Launched at Clean Energy Ministerial on 1<sup>st</sup> June 2016**

**Network of over 700 contributors, researchers & reviewers worldwide**

**The report features:**

- “ Global Overview
- “ Market & Industry Trends
- “ Distributed Renewable Energy for Energy Access
- “ Investment Flows
- “ Policy Landscape
- “ Energy Efficiency
- “ Feature: Community Renewable Energy

**The report covers:**

- “ All renewable energy technologies
- “ The power, heating & cooling, and transport sector
- “ Energy Efficiency

# Global Investment in Renewable Energy

Global new investment estimated **285.9 billion** in 2015

For the first time in history, investment in renewables excluding large hydro in developing countries outweighed that in developed economies

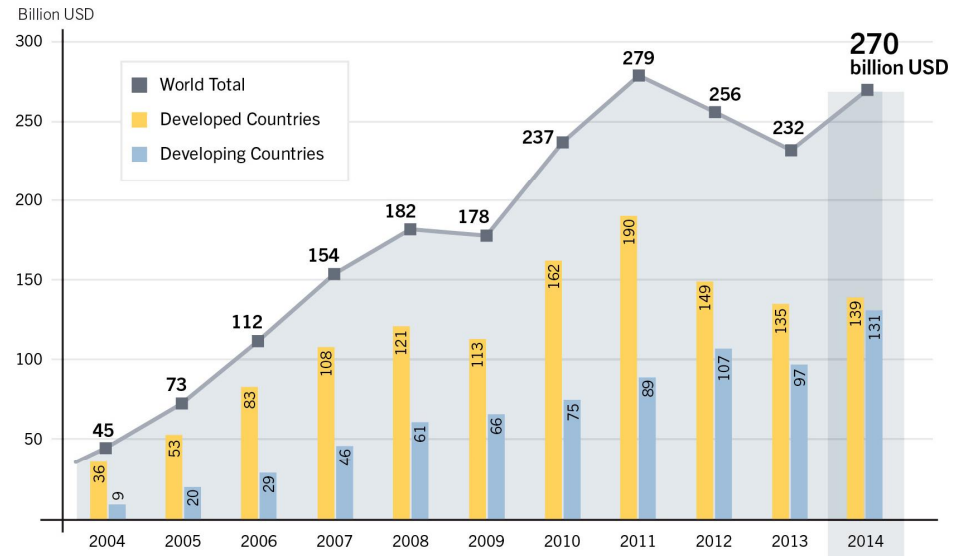
## Developed countries:

USD 130 billion investment  
↘ 8% (compared to 2014)

## Developing countries

USD 156 billion investment  
↗ 19% (compared to 2014)

Global New Investment in Renewable Power and Fuels, Developed and Developing Countries, 2004–2014



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Source: Frankfurt School–UNEP and BNEF

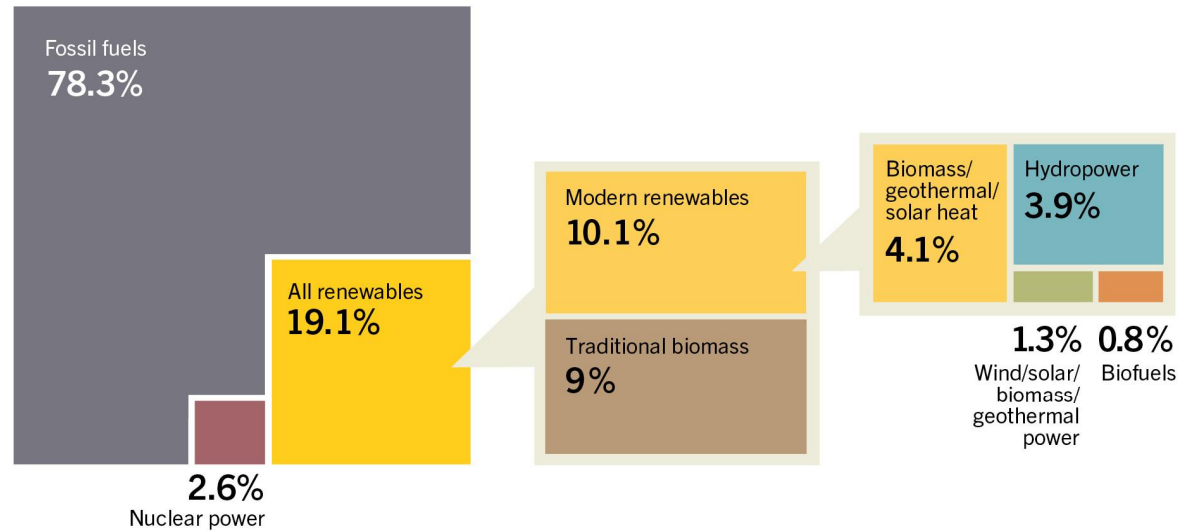


# Renewable Energy in the World

Renewable energy provided an estimated **19.2%** of global final energy consumption in 2014.

Growth in capacity and generation continued in 2015, but varies in the sectors

Estimated Renewable Energy Share of Global Final Energy Consumption, 2013



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Renewables rising rapidly, but the share is not growing as quickly

- displacing large stock of existing infrastructure and fuels in developed countries takes time
- energy demand in developing countries rises quickly and fossil fuel play a significant part in meeting increased demand



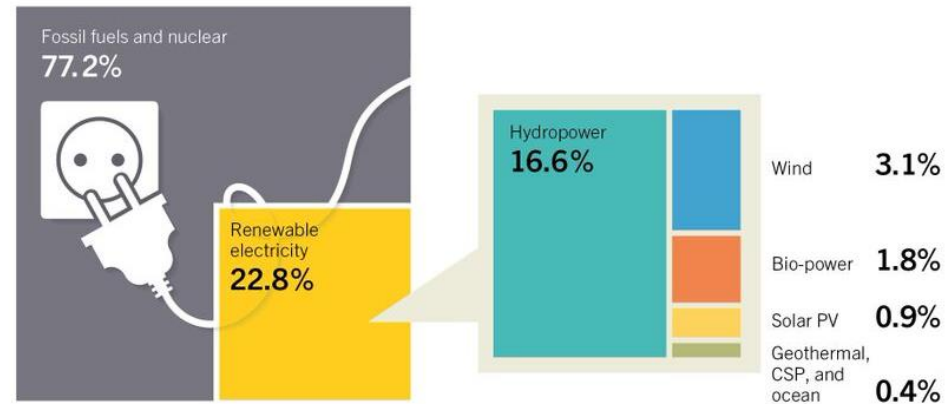
## Power Sector

In 2015, renewables covered **23.7%** of global electricity demand (up from 22.8%).

Renewables made more than **60%** of net additions to global power capacity

Total RE power capacity: **1849 GW**, largest increase in capacity ever

Estimated Renewable Energy Share of Global Electricity Production, End-2014



Based on renewable generating capacity in operation at year-end 2014.

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- “ Lowest-ever prices for renewable power long-term contracts in the power sector
- “ PV and wind are driving the renewable power market and are cost-competitive with new fossil fuel capacities
- “ Developments in renewable powerbut push the electrification of other sectors



## Solar Photovoltaics (PV) – total global capacity

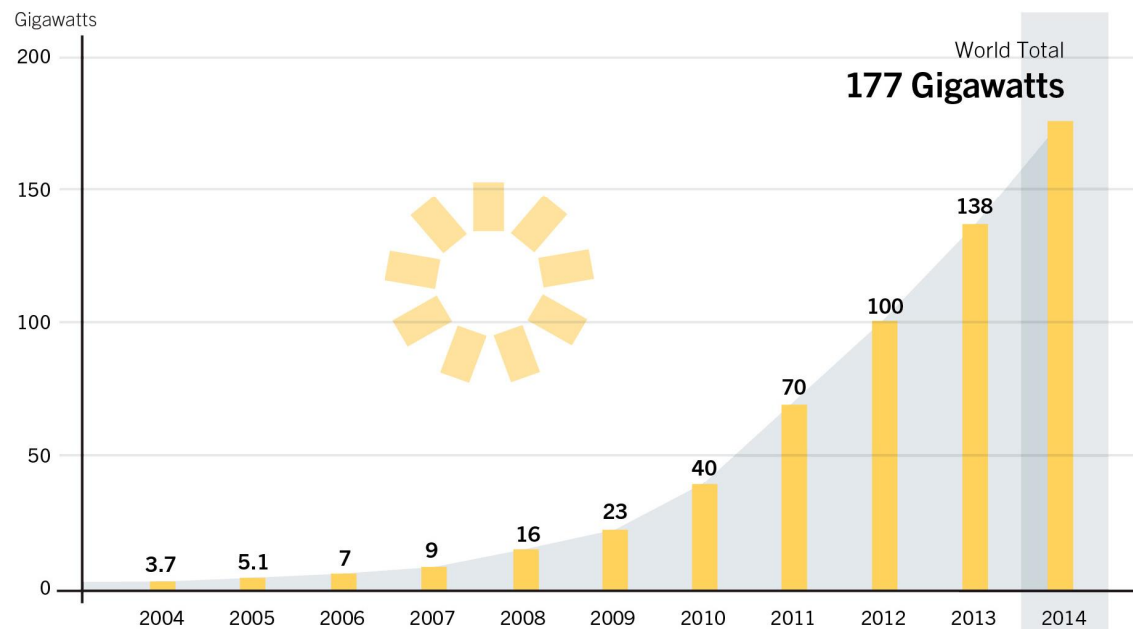
Solar PV:

- **+50 GW** added (10.6 GW in China in 2014; approx. 15 GW in 2015)
- Total capacity: **227 GW**

**More than 60% of all PV capacity** in operation worldwide at the end of 2014 was **added over the past three years.**

**Asia** accounted for almost **60% of global additions** in 2015.

Solar PV Global Capacity, 2004–2014



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REN21 Renewable Energy Policy Network for the 21st Century

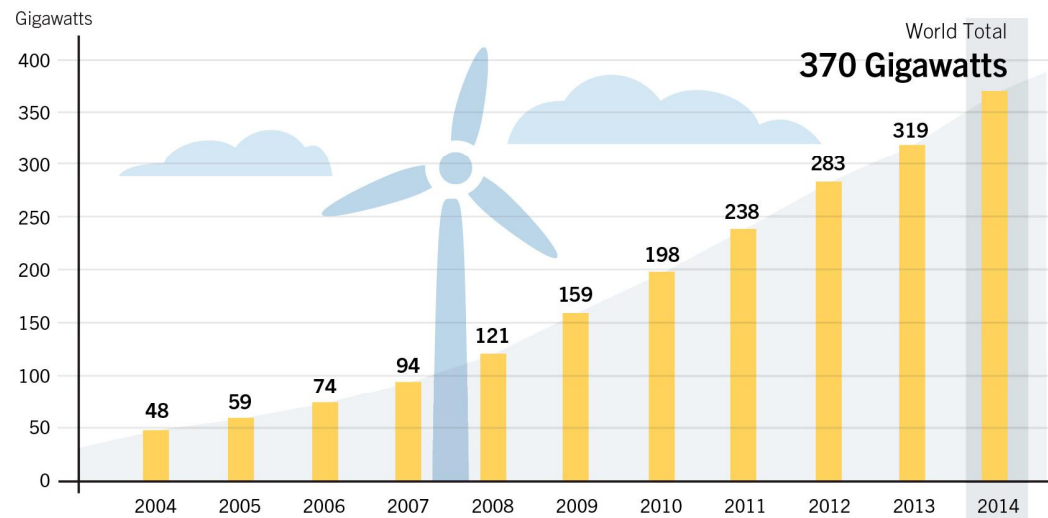
## Wind Power – total world capacity

**2015: 63 GW** of capacity were added (out of which 30.5 GW in China)

Total installed capacity: **433 GW** (out of which 145 GW in China)

Offshore: world total exceeding **12.1 GW** in 2015 (+ 3.3 GW)

Wind Power Global Capacity, 2004–2014



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- Leading source of new power generating capacities in US and Europe, 2<sup>nd</sup> largest in China
- covering high shares of power demand (DK: 42%, four states in D: 60%, UY: 15.5%)



## Heating & Cooling

Energy use for heat accounted for about half of total world final energy consumption in 2014. Three-quarters of global energy use for heat is fossil fuel based.

Small but growing modern renewable energy share of final global heat demand: **approx. 8%**. Mostly biomass, but also solar thermal and geothermal

Policy support for renewable heating & cooling remained far behind other sectors



Low fossil fuel prices challenge already slow developments

- Renewable heating & cooling continued to rise, but global growth rates declined
- Slowdown in renewable H&C investment

## Transport

Renewable energy accounted for an estimated 4% of global fuel for road transport in 2015.

Trends in the development of **gaseous fuels** and electricity continued to create pathways for the integration of renewables into transportation.

Advances in new markets and applications, like aviation fuels

Large focus on efficiency and local air pollution



- Low fossil fuel prices affected growth rates and appetite for new investment
- biofuels were sheltered in many locations, where blending mandates exist

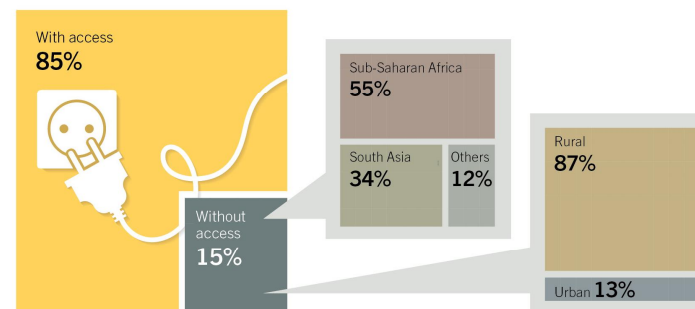
## Distributed Renewable Energy for Energy Access

**Distributed renewable energy** systems offer opportunity to accelerate the transition to modern energy services in remote areas

2015 saw positive market trends and increased investment.

- Solar PV markets flourished off-grid solar PV market: USD 300 million per year
- More than 70 countries have off-grid solar PV capacity installed or programmes
- 6 million SHS installed beginning of 2015
- 276 million US invested in off-grid solar companies

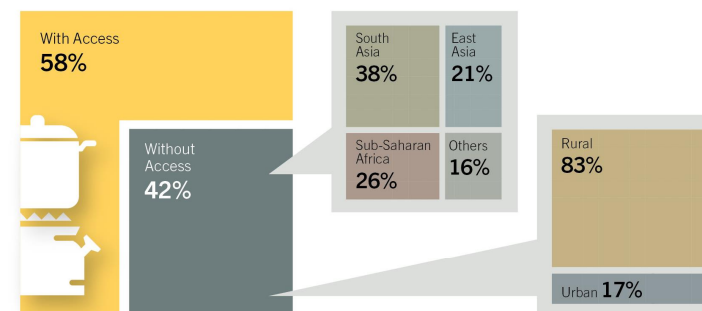
World Electricity Access and Lack of Access by Region, 2012



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World Clean Cooking Access and Lack of Access by Region, 2012

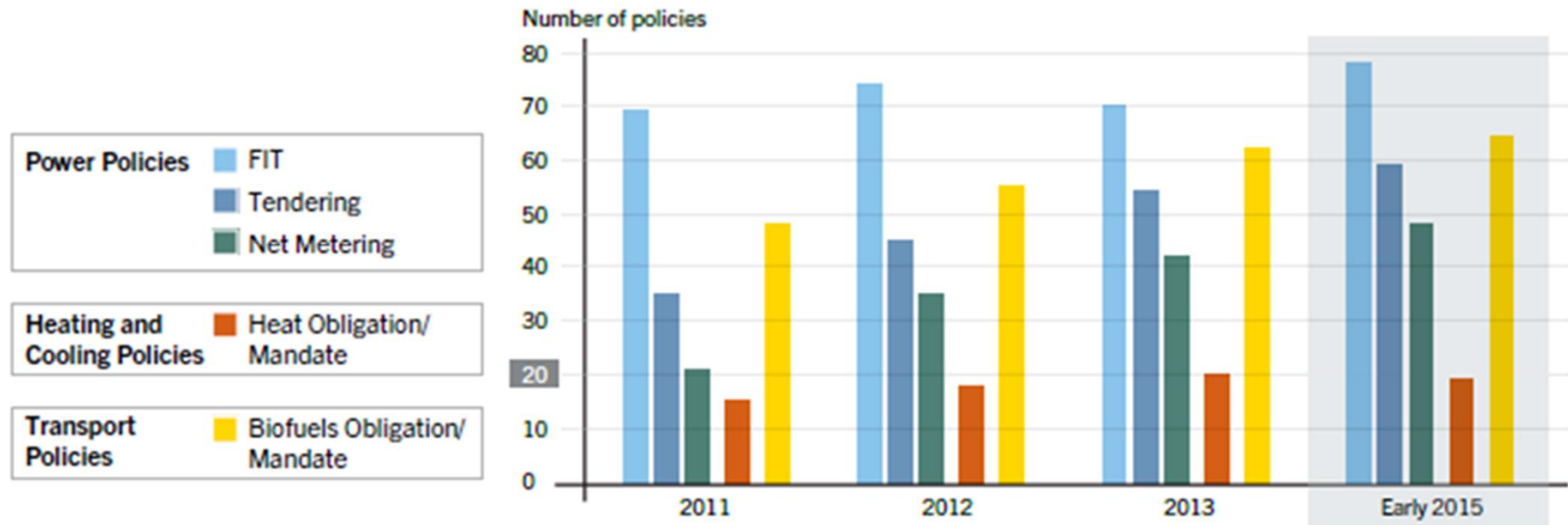


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# Renewable Energy Policy Landscape

Number of Renewable Energy Policies, by Type, 2011–Early 2015



**Power sector:** the main focus of policies over the last years

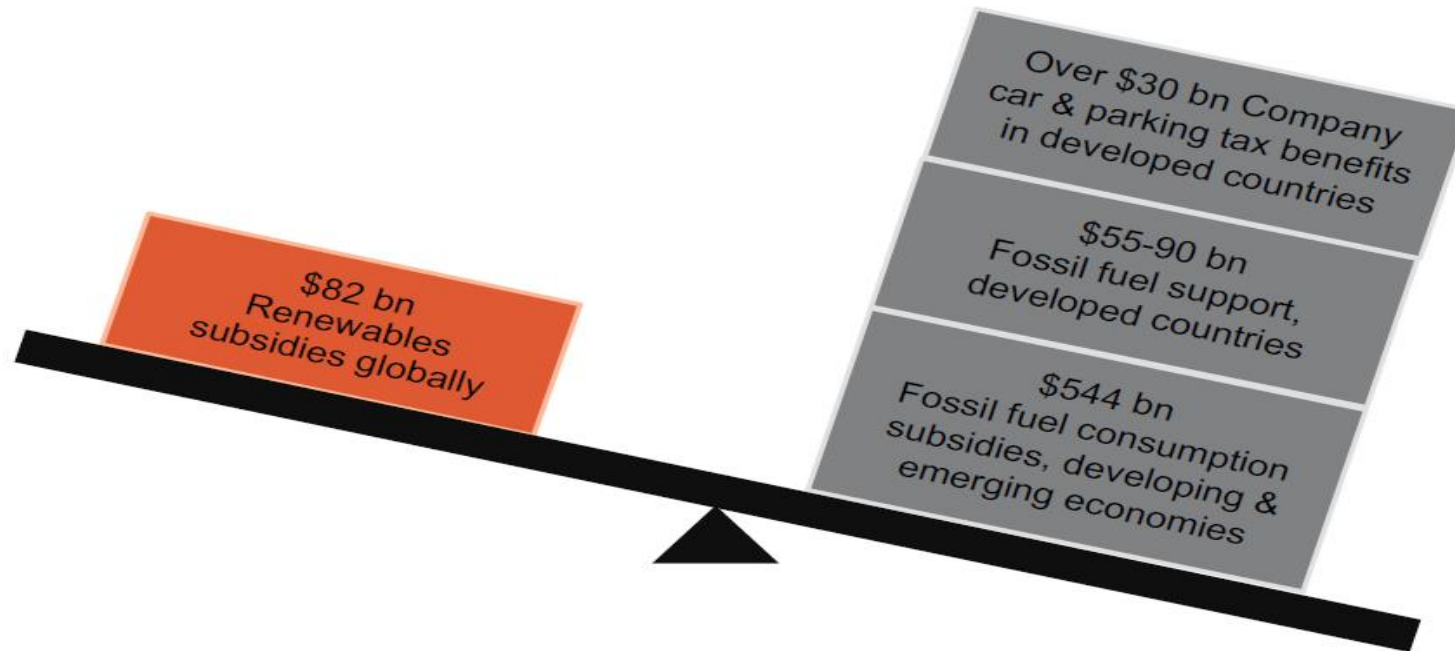
- FITs were the most popular type of policy
- **Net metering or net billing policies** in force in 48 countries, increase of approx. 220% (2010)

**Heating & Cooling** in particular needs stronger policy development/support

Biofuel blending mandates illustrate the crucial role of policy support

# Why do we have to support renewables?

## ELIMINATING ENVIRONMENTALLY HARMFUL SUBSIDIES - ENERGY



Sources: OECD (2013), Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels; IEA (2013), World Energy Outlook; IEA (2013), OECD (2014, forthcoming)

## Renewable Energy in Asia

Asia installed the most **renewable energy power** generating capacities

- **China:** leader in additions in hydropower capacities, bio-power, records in wind and solar PV additions; leader in renewable investment
- **India :** among the top countries for solar PV, hydro and wind power capacity additions
- **Japan:** second in total PV additions
- **Malaysia, Pakistan, the Philippines, the Republic of Korea, Thailand and Vietnam** – have emerged as important markets for more than one renewable power technology.
- **Bangladesh, China, India, and Nepal** witnessing rapid expansion of small-scale renewable systems, including renewables-based mini-grids.

### Renewable energy heat

- Modern biomass for residential heat markets has grown, especially in **Japan and the Republic of Korea** (strict efficiency requirements)
- China leading in terms of installed capacities in solar thermal, geothermal, biogas heat

In the **transport sector**, ethanol continued to grow, biodiesel production fell sharply



## Final conclusions

Impact of low oil prices, and also natural gas and coal prices

- Negative impact on some renewable energy markets, in particular heating & cooling as well as transport
- No/little impact on renewable power markets
- Underline the improved cost competitiveness of solar and wind power
- Opportunities for renewables as rising concerns about volatility of fossil fuel prices


## Actions

- Low fossil fuel prices is an opportunity to phase out fossil fuel subsidies
- Address policy support in the heating & cooling sector
- Energy planning and policy design need to integrated long-term perspectives in heating & cooling and transport



**GSR2016 Thunderclap campaign**

**<http://thndr.me/uFywwV>**

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**RENEWABLES RISING**

**HELP US SPREAD THE WORD & JOIN THE CAMPAIGN**

# RENEWABLE ENERGY POLICY NETWORK FOR THE 21<sup>st</sup> CENTURY



*Global Status Report  
yearly publication  
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*Regional Reports*



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